SPK-12688
Feb 1992

TABLE OF CONTENTS
PREWIRED WORKSTATIONS - MILCON

2.13 Power Poles
2.14 Task Lighting
2.15 Communications
2.16 Product Safety/Fire Safety

PART 3 EXECUTION

3.1 Location
3.2 Identification
3.3 General Requirements
3.4 Delivery, Storage and Handling
3.5 Installation
3.5.1 Final Layouts
3.5.2 General
3.5.3 Wiring
3.6 Post Installation Requirements
3.7 Training Program

SPK-12688
Feb 1992

PREWIRED WORKSTATIONS

****

NOTE: This guide specification covers prewired workstations for use in new construction under the Military Construction Program (MCP).

****

NOTE: Do not refer to this guide specification in the project specification. Use it as a manuscript to prepare the project specifications. Edit and modify this guide specification to meet object requirements. Where "specify", "as indicated", "as detailed", or words of similar import are used, include all requirements so designated on project6 drawings and within project specifications.

****

NOTE: Where numbers, symbols, words, phrases, clauses, sentences, or paragraphs in this guide specification are enclosed in brackets, (), a choice or modification must be made; delete inapplicable portions (S). Where blank spaces enclosed in brackets occur, insert appropriate data. Delete inapplicable paragraphs.

****

PART 1 GENERAL

1.1 SUMMARY. This article is not used by the Directorate of Engineering and Services except in specialized cases. Delete this article when editing for project specification.

1.2 REFERENCES. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the test by the basic designation only.

1.2.1 Air Force Documents

1.2.1.1 AFR 88-15: Criteria and standards for Air Force Construction (HQ USAF/DA, Bolling AFB, Washington DC 20332-5000).

1.2.2 Commercial Documents

1.2.2.1 American National Standards Institute (ANSI) Standards: (1430 Broadway, New York, NY 10018) and Business & Institutional Furniture Manufacturer's Association (BIFMA) (2335 Burton S.E., Grand Rapids, MI 49506).

1.2.2.1.2 x5.5-1983 Office Furniture and Desk Products

1.2.2.1.3 x5.6-1986 Office Furniture and Desk Products

1.2.2.2 American Society for Testing and Materials (ASTM) Publications (1916 Race Street, Philadelphia, PA 19203).

1.2.2.2.1 C-423 Sound Absorption and Sound Absorption Coefficients by the

Reverberation Room Methods.

1.2.2.2.2 E-84 Standard Method of Testing for Surface Burning Characteristics of Building Materials.

1.2.2.3 National Fire Protection Association (NFPA) (Batterymarch Park, Quincy, MA 02269).

1.2.2.3.1 NFPA 255 Standard Method of Testing for Surface Burning Characteristics of Building Materials.

1.2.2.3.2 NFPA 701 Standard Methods of Fire Test for Flame-Tetardant Textiles and film.

1.2.2.4 Underwriters' Laboratories, Inc (UL) Publication (333 Pfingston Rd., Northbrook, IL 60062).

1.2.2.4.1 UL-723 Test for Surface Burning Characteristics of Building Materials.

1.2.2.4.2 UL-1286 Office Furnishing

1.2.3 Other Government Documents

1.2.3.1 General Services Administration (GSA) Regulation's (General Services Administration, Public Building Services, 18th and F St, NW, Washington DC 20405).

1.2.3.1.1 Public Building Service PBS-C.2 Procedure III-s, Test Method for the Sufficient Verification of Speech Privacy Potential.

1.3 SUBMITTALS The bidder shall provide the following submittals for approval.

1.3.1 Shop drawings. Submit in sufficient detail to verify installation method and compliance with requirements. Successful bidder will be required to submit detailed drawings, see applicable sections of this document for details.

1.3.2 Test Reports. All products shall be tested in accordance with the applicable requirements. Provide one complete and certified set of test reports which verify that the proposed items meet or exceed the minimum requirements set forth. The test reports shall be not more than three years old at the time set for receipt of the offers. Test reports shall equivalent tests may be substituted when required. Tests shall include the following:

1.3.2.1 Panel Flammability. The fire test shall be conducted in accordance with ASTM Standard E-84, by an independent laboratory. The test shall be conducted on the entire assembled panel and conducted on each different combination of fabric and interior construction. Alternatively, testing may be conducted in accordance with UL Standard No. 723 or NFPA standard No. 255.

1.3.2.2 Fabric Flammability. Fabric flame resistance shall be tested in accordance with NFPA Standard No. 701.

1.3.2.3 Panel acoustics. The acoustics test for the NRC shall be conducted, by an independent laboratory, in accordance with ASTM C-423. NRC shall be measured in accordance with the GSA test including methods for the rating of functional interzone attenuation and NC background. The test shall be conducted on the entire assembled panel, full face area (the complete core, adhesive, decorative fabric, frame and joining components). NRC shall utilize an average measurement over the four standard octave intervals, 250, 500, 1000 and 2000Hz. NRC calculation shall be based on the absorption area of the panel. Both sides of the panel shall be tested. The test must be conducted on each different interior construction offered as an acoustical panel.

1.3.2.4 Panel and panel supported components. Panels and panel supported components shall be tested in accordance with the requirements of the ANSI/BIFMA X5.6-1986. Representative items shall be selected for testing based on worst case situations (ie: the deepest and widest work surface or shelf).

1.3.2.5 Keyboard drawer or shelf test. Apply a 50 pound load to the center of the keyboard shelf for a period of 5 minutes. Any loosening of attachments, permanent deflection or damage to the operation of the drawer or shelf shall be cause for rejection.

1.3.2.6 Panel electrical system. The panel electrical system shall meet the requirements of UL Standard 1286.

1.3.2.7 All lights (task or ambient) offered shall be UL approved or approved by other independent testing laboratories using recognized industry. standards.

1.3.2.8 Mobile Units. Pedestal drawers shall be tested in accordance and meet the requirements of with Section 6, 7, 8, 9 and 13 of ANSI/BIFMA x5.5-1983 with the following exceptions:

(a) Data printout file drawers shall be loaded with 2-1/4 pounds per linear of depth.

(b) The stability test section 13, shall be conducted with all

drawers empty, except the drawer within the largest capacity which shall be loaded as specified in 13.2. Any devices used to maintain the stability of the unit, such as counterweights, shall be included in all product furnished under the contract.

1.3.2.9 Caster durability test. The mobile unit shall be loaded with two pounds per linear inch in all drawers (not including convenience tray). The complete unit shall be pushed forward and pulled backward over barrier strip 1/8 inch high, minimum, at a rate of 7 to 10 cycles per minute for 20,000 cycles. One cycle is a forward and backward stroke. Structural failure, damage, deformation or loosening of parts which affect stability or serviceability or could cause personal injury to a user is cause for rejection.

1.3.2.10 Mobile work surfaces shall be tested in accordance with the requirements of ANSI/BIFMA x5.5-1983, with the following exceptions:

(a) For open base units, the deflection under load and the permanent set shall be measured within one inch of the front edge at the center of the top. The maximum deflection under load at corners shall not exceed 0.30 inches. The total deflection at the center shall not exceed 0.010 inches per inch of top length. The permanent set shall not exceed 0.06 inches at the leg and 0.002 inches per inch of top length at the center.

(b) The leg impact test shall be conducted with the weight6 striking the table leg at the most forward point of the leg.

1.3.2.11 Adjustment operation test. The work surface shall be placed on a flat level surface. A load shall be applied through a 12 inch disk, placed within 1 inch of the front edge of the top at the center. For A single surface unit the load shall be 300 pounds. For a dual surface stand the load shall be 75 pounds for the keyboard surface and 200 pounds for the CRT surface. The stand shall be operated thought the entire adjustment range, without binding or damage to the mechanism. The load shall then be moved to within 1 inch of the left or right edge of the stand and the test repeated.

1.3.2.12 SPECIFY if required. Any other load bearing, performance tests, etc. as required.

1.3.3 Product Literature

1.3.3.1 Five complete set (SPECIFY if different) of manufacturers general catalog/literature which provides data and part number for all components/furniture to be furnished under the contract.

1.3.3.2 Five sets (SPECIFY if different) of installation instructions for all components/furniture to be furnished under their contract.

1.3.4 Samples required: Five sets (SPECIFY if different) of the following samples are required for the project:

1.3.4.1 All fabric types and colors. Samples shall measure SPECIFY size (minimum required 2 x 2 inches) and shall have labels on the back designating the manufacturer, material composition and thickness, color and finish.

1.3.4.2 All work surface types. Samples shall measure SPECIFY size (minimum required 2 x inches) and shall have labels on the back designating the manufacturer, material composition and thickness, color and finish.

1.3.4.3 All panel and component trim. Samples of the actual trim shall have labels designating the materials and the colors or stains. SPECIFY size required.

1.3.4.4 Metal components with factory baked enamel or painted finishes. Samples shall be SPECIFY size (minimum required 2 x 2 inches) and have labels designating the materials and the colors.

1.3.4.5 Panel safety or tempered glass. Furnish certificates that designate the material and safety ratings when glazed panels are as specified.

1.3.4.6 SPECIFY any other sample requirements such as doors, lights, etc, that the technical specifications or finishes are different than those items already specified. This is normally not requested unless there are special requirements.

1.3.4.7 The government reserves the right tot reject any samples that do not satisfy the construction or color requirements. The contractor shall submit additional samples as required to obtain final approval. No work shall proceed without sample approval in writing from the government (Users to be consulted on all samples).

PART 2 PRODUCT REQUIREMENTS

2.1 GENERAL

2.1.1 This specification establishes the minimum requirements for all labor and materials required for the acquisition and installation of a complete and usable system of dismountable and relocatable workstations composed on interconnecting prewired panels, electrical hardware, panel-supported and accessory components.

2.1.2 The workstation requirements/attributes shall comply with the furniture typicals shown in the drawings. The dimensions of the workstation may vary +/- (INSERT % of the requirements) requested. Certain types of storage may be accomplished by more that one means, combined totals (materials/folders may be stored in a file drawer or closed overhead bin) may be used at the manufacturer's discretion but must have the approval of the government prior to ordering.

2.1.3 The dimensions specifically noted on the contract drawings indentify required clearances and aisle widths and other dimensional concerns. The completed installation shall comply with the current edition of the uniform Federal Accessibility Standards.

2.1.4 Station configurations shall conform to standard manufactured components. All panels, components, hardware, etc. shall be standard products as shown in the most recent published price lists or amendments and shall be of same manufacturer unless otherwise specified and approved thought

the user prior to ordering.

2.1.5 The manufacturer shall be a company specializing in the manufacture of commercial systems office furniture for a minimum of five years.

2.1.6 Furniture noted as not in contract (NIC), are not part of this contract; however, this furniture shall be part of the finished space and space required for this furniture shall be maintained.

2.1.7 All panels and components shall be of a design, material , and workmanship to withstand hard daily use over a five year extended life with a minimum of maintenance and repair.

2.1.8 The manufacture shall guarantee for period of five years or the length of a phased installation, whichever is longer, the availability of components, fabrics and finishes compatible with the original installation.

2.2 Panels

2.2.1 The panel system shall be capable of structurally supporting cantilevered work surfaces, shelves, files and other components in the disconfigurations shown on the plans, and specifications, and without special modifications to the panels.

2.2.2 The panel system shall be capable of structurally supporting more that one full-loaded component per panel per side and at vertical mounting intervals of approximately one inch.

2.2.3 Panel support legs shall be provided where panel configuration does not provide sufficient support or where load conditions dictate. Legs shall be of an abrasion and stain resistant coated surface on metal and shall be capable of attaching into panel-slotted side rail before or after panel erection. Glides shall be provided for adjustment and support.

2.2.4 The panel system shall provide for precise alignment of adjacent panels. Panels shall have leveling glides which do not require level floors and provide a minimum of one inch vertical adjustment. The distance between the floor and the bottom of the panel shall not exceed one and one-half inches.

2.2.5 The panel system shall be available in nominal widths SPECIFY requirements (range form 18 inches to 60 inches) as designated on the drawings. When applicable list all required widths and permit reasonable dimensional tolerance (+/- inches) where possible. Variations to these widths shall require government approval.

2.2.6 The panel system shall be available in nominal heights SPECIFY requirements (range from 30 inches to 86 inches) as designated on the drawings and measured from the finished floor to the top of the panel. ALL powered and non-powered panels shall be compatible in heights. When applicable list all required heights and permit reasonable dimensional tolerances (+/- inches) where possible. Variations to heights shall require government approval.

2.2.7 Minimum panel thickness shall be two inches.

2.2.8 Panels shall have the capability of assembly and disassembly in a vertical position and shall be non-progressive (ie, a centrally located panel can be removed with out disassembly of the entire panel run).

2.2.9 Panels shall be available in the following surface options SPECIFY requirements ie,: acoustical, tackable, glazed, open frame, metal, vinyl or any other required surfaces.

2.2.10 All exposed panel frames, trim and hardware shall have SPECIFY requirements ie,: factory baked enamel finishes, wood, plastic, vinyl, fabric, etc.

2.2.11 All glazed inserts shall be safety or tempered glass.

2.2.12 Panel Acoustic. Acoustical test for the NRC and STC shall be

conducted by an independent laboratory. See section 1.3.2.3 of this document for test requirements. The acoustical panels offered shall have a minimum noise reduction coefficient (NRC) of SPECIFY requirement (not less than 0.08 accepted) when tested at 250, 500, 1000 and 2000 Hertz or not less than 0.85 for the speech frequency range of 1000, 2000 and 4000 Hertz. The minimum sound transmission class (STC) shall be SPECIFY requirement (not less than 20 accepted).

2.2.13 Each face of fabric-faced panels shall have a seamless piece of fabric covering stretched over the entire face of the pane. Curved panels may use adhesives on curved sections. The fabric shall be attached securely and continuously along the entire perimeter of the panel and shall be capable of easy removal and replacement in the field.

2.2.14 Fabrics must be flame resistant and tested according to flamability tests described within this document. Fabrics may be made of polyester, nylon, wool, blends, or other fabric compositions as required. SPECIFY type of fabric material and weight per linear foot or weight per square yard.

2.2.15 All panels shall be tackable or capable of accommodating fabric-covered tackboards. The fabric material and color shall be coordinated with the panel fabric.

2.2.16 If required, door panels shall have a rigid metal frame with threshold and nominal width of 36 inches. Door frame should be adaptable to left or right hand swing. (Handicaped accessibility may require varying widths, SPECIFY requirement.)

2.2.17 Base raceways shall be an integral part of the panel.

2.2.18 Base covers held on by magnets will not be acceptable.

2.3 Leveling Glides The system shall provide precise alignment of adjacent panels and shall include leveling glides to compensate for uneven floors. A minimum 3/4 inch adjustment range is required. When placed on a level surface with the glides fully retracted the maximum distance between the panel and the floor shall be 1 inch.

2.4 Panel Connection Systems

2.4.1 The panel system shall be capable of connection in a variety of configurations as shown on the drawings, including connection of panels of differing heights and connection of two, three or four panels from a single point.

2.4.2 The panel system shall have connectors (ie. hinge, post, etc.) which accommodate a variety of panel configurations.

2.4.2.1 Straight line connection (180 degrees) of two panels.

2.4.2.2 Corner connection (90 degrees) of two panels.

2.4.2.3 "T" connection (90 degrees) of three panels.

2.4.2.4 Cross connection (all 90 degrees) of four panels.

2.4.2.5 Hinged connection of two panels for setting the panels at any angle. SPECIFY only if required.

2.4.3 The connector system shall provide tight connections which provide continuous visual and acoustical seals.

2.4.4 The finish of all filler posts shall match the finish and the color of the panel trim or shall be fabric covered to match the panel fabric. SPECIFY requirement.

2.4.5 Each filler post shall have a top cover that shall match finish and color of the panel trim and shall be level with the panel top rail.

2.4.6 The connector system shall allow removal of a single panel within a typical workstation configuration, without requiring disassembly of the workstation or removal of adjacent panels.

2.4.7 Right angle (90 degrees) connections shall not interfere with the capability to hang work surfaces and other components on any adjacent panel.

2.4.8 Connectors system shall provide, as required, for the continuation of electrical and communications wiring within workstations and from workstation to workstation.

2.4.9 The connector system shall provide, as required, for the continuation of electrical and communications wiring within workstations and from workstation to workstation.

2.5 Work Surfaces

2.5.1 Work surfaces shall be available in nominal depths SPECIFY requirements (ie: 20, 24, and 30 inches, +/- 2 inches. Permit reasonable tolerances when possible.) as designated within workstations and from workstation to workstation.

2.5.2 Work surfaces shall be available in nominal lengths from 24 to 72

inches (SPECIFY) and in nominal thickness from 1 1/8 to 1 3/4 inches as designated on the contract drawings. When applicable list all other required lengths. Variations to these lengths shall require government approval.

2.5.3 Work surfaces shall have a finished top surface of high pressure plastic laminate, wood veneer or composite wood grain and shall have smoothly furnished underside (Pre-drilled holes for mounting componentry is allowed).

2.5.4 The work surface shall not be affected by ordinary household solvents, acids, alcohols, or salt solutions and shall be capable of being cleaned with ordinary household cleaning solutions.

2.5.5 All work surfaces shall be either fully supported from the panels or supported jointly by the panels and supplemental legs, pedestals, or furniture end panels. Supplemental and supports should only be used under work surfaces when the work station configuration does not permit full

support by the panels.

2.5.6 Metal support brackets, in colors and finishes to match or coordinate with panel trim or work surfaces (SPECIFY), shall be used to support work surfaces from the panels. These brackets shall provide metal-to-metal fitting to the vertical uprights of the panels and shall lock the work surfaces inplace without any panel modifications.

2.5.7 SPECIFY requirements when applicable, work surfaces shall be height adjustable in 1 to 1 1/2 inches increments from 25 to 41 inches above the finished floor.

2.5.8 Pedestal supports for peninsula work surfaces shall accommodate writing and /or typing heights as required (SPECIFY). Provide all hardware necessary to attach peninsula work surfaces to a panel or to other work surfaces of varing heights.

2.5.9 Abutting work surfaces shall meet at equal heights when used in side-by-side or side to end configurations in order to provide a continuous and level work surface unless otherwise specified. If abutting surfaces are of different heights, caps enclosing open gaps between surfaces are desirable (SPECIFY if required).

2.5.10 Work surfaces shall be capable of accepting an attached articulating adjustment keyboard pad. If required, SPECIFY and show locations on drawings. The attached keyboard pad shall have the capability to fully recessed under the work surface and extend to give the user full access to the keyboard (approximately 10 inches). Side travel rotation shall be a 180 degree swing or a minimum of 15 inches in each direction. SPECIFY finish requirement.

2.5.11 If mobile keyboard pads are specified in lieu of attached pads, mobile units must be able to fit under the normal height of a work surface. SPECIFY finish requirement.

2.5.12 Computer turntables shall be available. SPECIFY equipment and show locations on drawings. Turntables shall have a minimum rotation of 240 degrees. SPECIFY finish requirement.

2.5.13 Must be able, where required, to provide grommetted access or covered wire management troughs to the work surface for cable and electrical cords. SPECIFY requirement and indicate locations on drawings.

2.5.14 It is desired that work surfaces have pre-drilled holes to accommodate pedestals. If not pre-drilled, work surfaces must be able to be drilled at the job site to accommodate pedestal locations.

2.5.15 The underside of cantilevered work surfaces shall have pre-drilled holes to accommodate additional supports.

2.5.16 Provide front modesty panels for all work surfaces where the knee area is exposed and as indicated on the drawings.

2.6 Pedestals

2.6.1 Pedestals shall mount to the underside of work surfaces, be free standing or mobile as indicated on the drawings.

2.6.2 It is desired for drawers to be interchangeable in the field. (Interchange two 6 inch drawers for one 12 inch drawer.)

2.6.3 Drawers and drawer pedestals shall be of steel construction with a factory-baked enamel finish. Color shall match panel trim. Drawer faces may be of plastic or wood construction and shall be securely attached with screw to the steel drawer front. Drawer faces shall match panel trim or work surfaces. (If different construction is require so SPECIFY.)

2.6.4 Mobile pedestals must be furnished with internal counter balance widths to prevent instability and tipping.

2.6.5 All hardware shall be recessed or flush mounted.

2.6.6 All file drawers shall have full extension ball bearing suspensions.

2.6.7 Each 6 inch high box drawer shall have minimum of one drawer divider.

2.6.8 All 12 inch file drawers shall have cradle type suspension ans shall operate smoothly and shall not open accidentally. Hanging files or a paper compression system are acceptable. Adapters shall be furnished with each file drawer to accommodate hanging folders front-to-back or side-to-side for legal or letter folders.

2.6.9 All 15 inch high EDP file drawers shall accommodate EDP printout sheets and have cradle type suspension and shall operate smoothly but shall not open accidentally.

2.6.10 All drawers within the pedestal shall be lockable either by a central lock that controls all pedestals under one work surface or individual keyed lock in each pedestal.

2.6.11 All drawer pedestals shall be field interchangeable from left to right or right to left and shall retain the pedestal locking system capability.

2.6.12 Pedestals shall have the capability to protect wires from being damaged by drawer opening and closing when wire management runs behind or along the side of the drawers.

2.6.13 The following box drawer options shall be available: i.e., pencil or convenience tray, reference shelf, stationary trays and be able to accept more than one divider. Magnets are unacceptable methods to be used to hold dividers and other devices in place. SPECIFY requirements.

2.6.14 Casters on mobile units must conform to the test requirements as stated in section 1.3.2.9 of this document.

2.7 Shelf Units and Flipper Door Cabinets

2.7.1 Shelves shall be of metal construction with formed edges and a factory

baked enamel.

2.7.2 All shelves shall have a depth to accommodate a standard 3 inch ring binder (8 1/2 x 11 inches) and shall span the full length of the supporting panel. SPECIFY if requirements differ.

2.7.3 Shelves shall accommodate for computer components storage and/or EDP printout when specified. SPECIFY if required.

2.7.4 Shelf-supporting end panels shall be of metal construction with formed edges and a factory baked enamel finish or shall be high density particle board, minimum 1/2" thickness, covered with high pressure plastic laminate or vinyl and with vinyl "T" molding edge.

2.7.5 Shelves shall be attached to metal supporting end panels with metal screws or lock clips and to particle board supporting end panels with wood screws or lock clips. Shelves shall be capable of supporting a uniform load of 36 lbs per linear foot.

2.7.6 All supporting end panels shall provide metal-to-metal connections to the supporting panels.

2.7.7 The underside of all shelf units shall have the same finish and color as the end support panels and shall accommodate the attachment of task lights.

2.7.8 All shelf units shall have relocatable shelf dividers at minimum of 9 inches on center horizontally. the dividers shall be of metal construction with a factory baked enamel finish matching or compatible to the shelf unit.

2.7.9 Shelf and door units should have mechanical safety catches or other device to prevent accidental disengagement.

2.7.10 Flipper doors shall have an interior construction of metal with formed edges, wood frame or particle board.

2.7.10.1 Metal doors shall have an exterior finish of factory baked enamel or a fabric covering and an interior finish of factory baked enamel.

2.7.10.2 Wood frame on particle board doors shall have an exterior finish of high pressure plastic laminate, textured vinyl covering or fabric covering and an interior finish of high pressure plastic laminate, textured vinyl covering or epoxy paint. A vinyl "T" molding edge shall be provided where appropriate.

2.7.11 Flipper door units (bins) shall be available with locks. Units must remain security fastened to the panel when in the locked positioned.

2.7.12 All flipper doors should be able to be operated by a seated person when flipper doors are mounted at 64 inches height (+/- 2 inches). Equalizers that prevent doors from pinching when operated from other than center balance points is desired.

2.7.13 All locks or handles on flipper doors must be flush or recess mounded.

2.8 Panel-Mounted Lateral Files (SPECIFY if required)

2.8.1 All lateral file drawers shall be panel-supported.

2.8.2 Lateral file drawers shall be of steel construction and a factory baked enamel finish. File fronts and end support panels shall be of equal construction to flipper door shelving units.

2.8.3 All hardware shall be recessed.

2.8.4 All lateral file drawers shall have full extension, ball-bearing drawer slides and shall operate smoothly, but shall not open accidentally.

2.8.5 Hanging file folders shall be used for letter size, legal size and EDP size files as indicated on the drawings. (Note that the depth of most of these drawers is 12 inches and not 15 inches found in a free standing lateral file.)

2.8.6 All lateral file drawers shall be available with individual key-operated locks.

2.8.7 File fronts of all stacked lateral file units shall have file content identification labels.

2.9 Finishes and Colors

2.9.1 All systems furniture panels and components shall be supplied in the following finishes and range of neutral and accent colors as shown on the contract drawings. All variations shall require government approval. SPECIFY finishes and select colors for all panels and components (i.e.: fabrics, metal finishes, trim, bases, hardware, connectors, power poles, work surfaces, etc.).

2.9.2 Final material, finish and color selections shall be provided to the contractor following contract award.

2.10 Locks and Keying (SPECIFY which system is to be used).

2.10.1 All drawers, flipper door cabinets, lateral files and file bins shall have keyed locks, unless otherwise noted.

2.10.2 Field changeable lock cylinders shall be provided with a minimum of 150 different key operations.

2.10.3 All workstations shall be individually keyed. All locks within a workstation shall be keyed alike.

2.10.4 All central file and storage units which are grouped together but are not part of a workstation shall be keyed alike, unless otherwise SPECIFIED.

2.10.5 Two keys shall be provided for each lock and three master keys shall be provided per area as shown on the contract drawings. Keys and lock cylinders shall be numbered for ease of replacement. A key schedule shall be submitted to the contracting officer at project completion. Copies of the

schedule are to be provided to the user and base civil engineers.

2.10.6 All locking equipment must be clearly labeled/tagged as to the workstation, key number and its location. For those manufacturers who have removable format locks, this will not be necessary.

2.10.7 Combination locks may be used in lieu of key locks. Instructions on changing combinations must be furnished for each lock and attached to the inside area (drawer) that is to be locked.

2.11 Other Components and Accessories

2.11.1 The contractor shall provide all brackets, supports, hangers, clips, panel-supported legs, connectors, adjustable feet, cover plates, stabilizers and other miscellaneous hardware required to provide a completed assembly.

2.11.2 Wall tracks should not be used unless absolutely necessary. If they are provided they must be in pairs where components are indicated. Tracks shall be of heavy-duty extruded metal furnish and color to match panel trim and shall be slotted on 1" centers in heights required. Slot spacing should match slot spacing for wall panels. SPECIFY required heights.

2.11.3 Wall mount kits shall be provided as required for securing panels ends to building walls at 90 degree angles. Kit shall match panel height and trim.

2.11.4 One panel-mounted coat hook per workstation occupant shall be provided at each manned workstation or workstation group, unless adequate wardrobe units are provided for coat storage.

2.11.5 Panel-mounted coat storage units with hat shelves shall be provided as indicated on the drawings.

2.11.6 Paper management units shall be provided as indicated on the drawings if required, SPECIFY. These units shall consist of diagonal paper storage units constructed of coated steel inserts with tabbed label holders and shall be capable of right or left hand orientation and legal or letter size lengths. Unit shall be free standing mount to rear of shelf/bin or mount to

the support panels by means of a mounting rail. Each unit shall be supplied with the following"

2.11.6.1 Mounting rails shall be equal in length to the wall panel and constructed of metal and finished to match panel trim. A latch-lock mechanism shall be an integral part of the rail.

2.11.6.2 Paper stops shall hold paper position uniform.

2.11.7 Tackboards. The fabric and color shall be coordinated with the panel fabric and color. The fire rating shall match the fire rating of the panel. Location and size shall be as shown on the contract drawings. (Tackable panels will eliminate this requirement.)

2.11.8 Erasable marker boards shall have a (SPECIFY color) porcelain writing surface and shall include (SPECIFY quantity per board) erasable liquid

markers, (SPECIFY quantity per board) chart hooks, storage tray, tack strip and end support panels to match the panel trim is desirable. Size and location shall be as shown on the drawings.

2.11.9 Counter caps and transaction counters shall be provided in accordance with the sizes and locations shown on the contract drawings. The finish shall match the finish of the work surfaces unless noted otherwise.

2.11.10 Determine and SPECIFY other requirements: paper management accessories, compressions systems, drafting surfaces, special lab requirements (special chemical resistant surfaces, wet sinks, etc.), special tilting requirements of surfaces, telephone stands, PC stands, pass through windows, lazy susans, angled shelves, drawer inserts, etc.

2.12 Electrical

2.12.1 The entire system shall use copper wiring and shall meet the applicable requirements of Underwriter's Laboratory (UL) and the National Electrical Code, or equivalent foreign standards. The label or listing of the Underwriter's Laboratories, Inc. will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this label or listing, adequate equipped testing must be shown indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements.

2.12.2 All powered and non-powered panels shall have raceways capable of distributing SPECIFY the number of circuits and the circuit capacity for all workstation configurations. Minimum requirement is 20 amp power circuits and the equivalent of six 25 pair communication cables with required connectors when powered. Unused access points shall be covered to prevent unsightly holes. Covers shall be replaceable or the raceway cover shall be easily replaced without disassembly of the panel.

2:12:3 SPECIFY, special wire management separation requirements, when cabling capacity or separation of high and low voltage is required for security.

2.12.4 All panel bases or mid-panel wire management systems shall have a minimum of one knockout or SPECIFY required number of knockouts to meet required needs, per panel per side for electrical access and minimum of two additional knockouts or SPECIFY required number of knockouts to meet required needs, per side for telephone, EDP and local area network wiring.

2.12.5 These base covers shall be securely mounted to panels but permit easy access to the raceway. Accidental dislodgment is not acceptable.

2.12.6 Panel base cover should not be secured by magnets.

2.12.7 The panel bases shall not extend past either panel face by more than one-half inch.

2.12.8 Metal or plastic end covers which attach securely to the panel base shall be provided as required and shall match the finish and color of the

panel base.

2.12.9 Non-powered panel raceways shall be capable of easy field conversion to powered panel raceways without requiring the panel to be dismantled and removed from the workstation.

2.12.10 All powered panels shall be identified on the drawings. Each powered panel shall be capable of having a minimum of tow single duplex 20 amp grounded electrical receptables per side. A single 20 amp receptacle shall be provided for all dedicated circuits.

2.12.11 All receptacles shall be commercial grade and identified easily by line/circuit identification numbers, letters or color codes.

2.12.12 Internal panel-to-panel power connections shall be straight or flexible plug-in and plug-out grounded connections and shall be installed to provide the powered panel configurations shown on the contract drawings.

2.12.13 Power and communication wiring shall be supplied to the panels either by top feed or base modules as indicated on the contract drawings. SPECIFY type of panel feed.

2.12.14 Base-feed modules shall supply power to the base panels by plugging into either side or the end of the raceway through receptable doors as well as access doors for routing the communication cables. SPECIFY location of hard wiring requirements to the building. Hard wiring capability should supply a minimum of 3 power circuits.

2.12.15 All panels shall be capable of accepting top, side or end feed modules.

2.12.16 Actual wire management capacity should allow for wire twist and corner 90 degree radius loss.

2.12.17 Accessories for an externally mounted vertical and horizontal wire management and concealment system shall be provided as indicated on the contract drawings and where use requirements dictate.

2.12.17.1 Horizontal wire managers shall be supplied for mounting under all work surfaces, where required. The wire managers shall be attached either to the underside of the work surface or to the vertical panel without damage to the face of the vertical panel. Exposed or loose wiring shall not be acceptable.

2.12.17.2 Wire managers shall be prefinished and shall secure, conceal and accommodate outlet cords as well as electrical and communication wiring.

2.12.17.3 Wire channels shall match color of panel trim, attach to panel or rail by means of self adhesive backing strip or clip-in attachment and shall conceal wire routed vertically.

2.13 Power Poles (Specify if power source is from the ceiling)

2.13.1 Power poles shall be provided as indicated on the contract drawings.

The poles shall be capable of caring SPECIFY requirement for number of circuits and cables. As a minimum each pole should have the capability of three 20 amp electrical circuits plus the equivalent of fourteen 25-pair communication cables.

2.13.2 Pole widths shall be equal to the width of the panels. The pole finish and color shall match the finish and color of the panel trim unless noted otherwise. SPECIFY finish and color.

2.13.3 Power poles shall be capable of being opened along the vertical access to permit the lay-in of wiring.

2.13.4 Each power pole shall have a junction box with cover, a vertical power plug, an end cap and ceiling trim plate which extends a minimum of one and one-half inches from all sides of the pole.

2.14 Task Lighting

2.14.1 Task lights shall be provided as indicated on the drawings. Such lights shall be a standard component of the manufacturer's system furniture products.

2.14.2 Task lights shall be available in colors to match that of the shelf and bins. The reflector shall be painted white or have a reflective lens finish for maximum light. Using the same color as the outer housing is not acceptable.

2.14.3 Task lights shall have structurally sound mounting devices which can be easily removed and replaced but will prevent accidental removal or dislodgment.

2.14.4 All fixtures shall be Underwriters' Laboratory (UL) approved or equivalent foreign standard for use in the configurations indicated on the drawings.

2.14.5 All fixtures shall have prismatic lenses, baffles or reflector systems necessary to provide a glare-free light which is shielded at eye level in a seated position and shall provide a minimum of 75 foot candles of

light without veiling reflections on the work surface directly below the fixture. Use energy efficient lamps, 40 watt fixtures whenever possible. The use of 40 watt fixtures is facilitated where one task light will span more than one bin or shelf.

2.14.6 Each fixture shall have an easily accessible on-off switch and one rapid-start ballast. Ganged fixtures of shared ballasts shall not be used.

2.14.7 All fixtures shall be provided with energy efficient lamps. SPECIFY lamp sizes, coloration and quantity required.

2.14.8 All fixture diffusers, grilles or other coverings shall be easily removable to permit cleaning and relamping.

2.14.9 Each fixture shall have a minimum of a six foot factory-installed, heavy duty electrical cord set with a grounded plug and be UL approved and

have left or right exit capability. SPECIFY if longer lengths are required.

2.14.10 A vertical, panel-mounted wire manager shall be installed with each task light. This wire manager shall be prefinished and cut to size and have the capability of begin field cut to size, and shall secure to the top of the work surface directly below. The wire manager shall be attached to the panel edge or connector strip without damage to the panel surfaces.

2.15 Communications

2.15.1 Telephone and Computer Systems: See Engineering Technical Letter (ETL) 87-9: Prewiring, for guidance on telecommunications and computer prewiring requirements. Workstations must provide appropriate cable management for telephone and computer data cable. All instrument connections and wiring through the raceways shall be accomplished by SPECIFY contractor or government personnel. SPECIFY responsibilities. The contractor shall identify the most advantageous time for installation of the telephone units and give access to the installer if done other than by the contractor. (Security reasons would be a reason when the government would be responsible for the installation.)

2.15.2 Telephones: SPECIFY requirements for wiring and equipment connection responsibilities. Instrument location shall be in accordance with the drawings.

2.15.3 Secure Telephone Units (STU-IIIs): SPECIFY only if required. With the advent of STU-III, both unclassified and classified conversations can be accomplished in the open office environment. Instrument location shall be in accordance with the drawings. (For the designer: Units should be placed in corners of space with the most effective use of sound absorbent partitions and preferably under open-louvered ceiling light fixtures. Any additional design elements should be determined and SPECIFIED to help retard unwanted telephone conversations from traveling between partitions.)

2.15.4 Computer Equipment: SPECIFY requirements for wiring and equipment connection responsibilities. Instrument location shall be in accordance with the drawings.

2.15.5 Local area Network: SPECIFY requirements for wiring and equipment connection responsibilities.

2.15.6 TEMPEST: SPECIFY only if required and identify responsibilities. All raceway systems shall provide management for TEMPEST computer cabling, power and telecommunications. Red signal and control distribution (dust, conduit or tray) must be separated from AC power distribution (in accordance with red/black installation procedure NACIM 5203). Recommend one raceway for communications along the top and one raceway for power along the bottom of the workstation partition.

2.16 Product Safety/Fire Safety

2.16.1 All panels, connectors, hardware and accessory components shall be free of rough or sharp edges. Corners of all products such as vertical panels, work surfaces, drawer pedestals and overhead cabinets and shelves

shall be radius or protected to ensure safety.

2.16.2 All floor to ceiling panels unsed in major egress ways shall be fire retardant and meet Class "A" requirements for flame spread (maximum rating 25) and smoke development (maximum rating 50), as specified by the National Fire Protection Association (NFPA 225) in the Life Safety Code 101 or by ASTM E-84. All panels used in other areas must meet a Class B rating not to exceed a smoke development of 100.

2.16.3 For additional test requirements refer to general testing requirements.

PART 3 EXECUTION

3.1 Location. The project includes various workstations and their supporting elements for SPECIFY user location.

3.2 Indentification. The breakdown of the types of workstations are as follows: SPECIFY breakout by description and quantity for each.

Identification Code	Description	Quantity
"Example"		
Workstation (code)	Clerical	37 each
Workstation (code)	Action Officer	150 each
Workstation (code)	Supervisor	20 each, etc.

3.3 General Requirements

3.3.1 The bidder shall be responsible for identifying, as part of the submittal, all differences between the proposed furniture installation and the contract drawings and specifications. To help illustrate compliance and/or identify differences, the bidder shall supply overhead views and isometrics or elevations of each workstation.

3.3.2 The general construction contractor shall be responsible for all design and installation costs associated with bringing into compliance with the drawing and specifications, differences not identified by the bidder or approved by the government.

3.3.3 The general construction contractor shall provide only items which meet the requirements as listed in the following specifications.

3.3.4 Scheduling. As a planning guide, manufacturers or their dealers should be able to deliver and install workstations within 120 days of receipt of signed contract. Times will vary depending on quantity.

3.3.5 Costs

3.3.5.1 Furniture Costs. Any manufacturers' government discount rate shall apply to all components necessary for complete installation, whether or not

the items are identified in the drawings and/or specifications. Contract award shall be based on the evaluation of the manufacturers ability to best meet the technical requirements and user needs as well as price.

3.3.5.2 Freight Costs. Any freight costs shall be included in the price unless otherwise stated.

3.3.5.3 Installation Costs. Total installation costs for the proposal are based on requirements identified in the drawings and specifications.

3.4 Delivery, Storage Handling

3.4.1 The general construction contractor shall be responsible for the receipt, storage, and handling of all materials and supplies necessary to provide a complete installation unless otherwise specified. If building construction delays occur, final receipt of the workstations shall be negotiated with the successful bidder.

3.4.2 The general construction contractor shall SPECIFY all delivery and storage requirements, constraints: including location, space limitations, cleaning and protection requirements, etc. The contractor shall confine all apparatus, storage of material and the operation of the work force to areas specified.

3.4.3 All furniture products shall be delivered in the manufacturer's original and unopened crating and/or covering (plastic covering or manufacturer's blanket wrapping).

3.5 Installation

3.5.1 Final Layouts. If the final layout deviated from the original bid layout the manufacturer must submit an installation plan for government approval and verify the following prior to beginning installation.

3.5.1.1 Telephone wiring and equipment locations.

3.5.1.2 EDP wiring and equipment locations.

3.5.1.3 Local area network wiring and equipment.

3.5.2 General

3.5.2.1 The installation shall include all items and labor required to assemble and power the individual and between work stations. It shall provide a complete and functioning work environment including but not limited to all work surfaces, panels, components, shelves, bins, pedestals, hardware, wire management and one ergonomic seat per workstation. (All labor and power connections between work stations and the building electrical distribution system will be performed by a qualified electrician.)

3.5.3.2 Assembly of equipment shall be possible with conventional tools as found at the local hardware store. If special tools are required they shall be furnished by manufacturer at no charge to purchaser. See section 3.7.2 of this document for quantities of tools required.

3.5.2.3 All workstations shall be fully flexible to permit easy assembly and disassembly by government personnel. Back to back workstations shall be assembled in such a manner so that components (bins, shelves, work surfaces, etc) may be completely removed from one side without disturbing the other side of separate workstation.

3.5.2.4 The system shall be capable of being installed on top of finished flooring regardless of type, without penetrating the finished floor or using floor fasteners. (Exceptions are made only where floor to ceiling partitions are used in conjunction with the total workstation layout. (SPECIFY when required.)

3.5.2.5 Unless otherwise stated, the government shall be responsible for all telephone wiring and equipment installation. The contractor shall permit access and identify the most advantageous time to the government to perform this work.

3.5.2.6 If applicable: Identify any other government furnished or installed items affecting the installation of the workstations.

3.5.2.7 The general construction contractor shall have a full time installation crew on which each member is a manufacturer authorized systems furniture handler and technical installer capable of the job requirements outlined on the final government approved workstation layout drawings and specifications.

3.5.2.8 Installation shall be in accordance with manufacturer's installation procedures.

3.5.2.9 If applicable: SPECIFY any phasing requirements.

3.5.2.10 If applicable: SPECIFY any concurrent actions requiring access to the furniture before installation is completed by the installer. (This would include communications wiring, etc.)

3.5.2.11 All systems furniture panels and components shall be installed level, plumb, square, and with proper alignment with adjoining furniture. The furniture shall be securely interconnected and shall be securely attached

to the building where required.

3.5.2.12 The installer/manufacturer shall clean, polish and inspect all panels and components to ensure that the installation is complete and that the furniture is free of defects and ready for use. The contractor shall repair all defects or replace damaged components to the satisfactions of the using the agency.

3.5..3 Wiring

3.5.3.2 The construction contractor shall be responsible for all electrical wiring for the workstations, between workstations and connecting the workstations electrical wiring to the building electrical distribution system. A licensed electrician shall make all hard wire connection to the building electrical distribution system as shown on the drawings and in accordance with the National Electrical Code.

3.5.3.2 All electrical wiring shall be in accordance with the contract drawings and specifications, the systems furniture manufacturer's installation procedures and the National Electrical Code, UL or equivalent foreign standards.

3.6 Post-Installation Requirements (SPECIFY time requirements).

3.6.1 The contractor shall provide drawings of the final installation showing all changes and revisions made up to the time equipment installation is completed and accepted. As-built drawings shall include an overall workstation plan layout and dimensioned isometrics or elevations of each type of workstation with all components identified by the manufacturer's catalog numbers. Tabulated drawings shall include all electrical circuits including routing identification and point of power pick up. As-builts shall be in a scale of 1/4 inch = 1 foot 0 inches (1:50) or 1/8 inch = 1 foot 0 inches (1:100) SPECIFY.

3.6.2 Panel plans dimensioned from finished face of walls, columns and partitions and keyed to a panel schedule describing colors, finishes, sizes and types. Panel drawings shall include all power poles, base panel feeds and all activated panel outlets.

3.6.3 Inventory Listing. Data and parts lists shall be provided. Two complete listings of all installed components shall be provided by the manufacturer to the government (one for users and one for base civil engineers), after completion of the installation.

3.6.4 Manufacturer's Literature

3.6.4.1 Three sets of product assembly manuals which describe assembly and reconfiguration procedures.

3.6.4.2 Three sets of product maintenance manuals which describe proper cleaning and minor repair procedures.

3.6.5 If applicable: SPECIFY any post installation requirements.

3.7 Training Program

3.7.1 The contractor shall train (SPECIFY number of hours of training required) government personnel (users and base civil engineers) on installing, reconfigurationing and maintaining the prewired workstations. This training shall be provided on site as part of the contract cost to the government and at times mutually agreed upon between the contractor and the government. (SPECIFY estimated time frames).

3.7.2 The contractor shall supply to the government at no additional cost (SPECIFY quantity: sets per workstations) all special tools and equipment neccessary for assembly of products to complete a major installation.

3.8 Service. Authorized company trained installation and service personnel shall be available in the U.S. and foreign countries. The name(s) of the factory trained installers/dealers to provide service and installation for

this project must be furnished with the bid. Failure to have trained personal available for service within (SPECIFY time requirements) is reason for disqualification.